COUNTY OF SUFFOLK

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DIVISION OF ENVIRONMENTAL QUALITY

STANDARDS FOR APPROVAL OF PLANS AND
CONSTRUCTION FOR SEWAGE DISPOSAL SYSTEMS
FOR OTHER THAN SINGLE FAMILY RESIDENCES

APPENDIX B

STANDARDS FOR APPROVAL AND CONSTRUCTION OF SEWAGE COLLECTION SYSTEMS AND TREATMENT WORKS

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APPENDIX B

STANDARDS FOR APPROVAL AND CONSTRUCTION OF SEWAGE COLLECTION SYSTEMS AND TREATMENT WORKS

B1. ENGINEERING REPORTS

Construction projects which include treatment works and/or large collection systems for sanitary wastes require supplemental design review and approval by the department prior to approval to construct being issued on the remainder of the project.

Design information is submitted to the department in the form of engineer's reports and plans and specifications. The department's review is conducted in two phases. The first phase is the submission of the engineering report. Following approval of this report, the second phase begins with submissions of plans and specifications. A copy of the final plans and specifications will be stamped with an approval stamp and returned to the authorized engineer. Projects with Suffolk County Sewer Agency contracts require review and approval by Suffolk County Department of Public Works in addition to Health Department review and approval.

All submitted documents shall bear the original seal and signature of an engineer licensed and registered to practice in New York State. Documents submitted shall be accompanied with a letter from the applicant authorizing the engineer to submit documents. Documents shall include a project application per WWM-003 or WWM-022, SCDHS submission instructions.

Designs shall conform to the GLUMRB "Recommended Standards for Sewage Works" (Ten State Standards) except where the requirements following allow differences. The project engineering report shall conform to the outline presented in Chapter 10 of the aforementioned standards. For small non-municipal type sewage treatment plants, a less elaborate report is usually acceptable. However, as a minimum, the information outlined below shall be included in the report.

The engineering report is reviewed to evaluate whether: a proper basis for design has been established; the design criteria of the GLUMRB (Ten States) standards and Suffolk County Department of Health Services standards have been utilized; and the design has a reasonable expectation of meeting its objective.

The engineering report shall include:

1. Project name and description, including location, size and type of development and/or service area and future additions.

2. The following site plans and information:

    A) A detailed site plan drawn accurately to scale of the planned development showing all property lines, topography, existing and proposed structures, rights-of-way, easements and proposed treatment plant site location. Scale shall not exceed 1 inch = 100 feet.

B) A town zoning map delineating the area under study.

C) A tabulation of setback requirements for zoning classifications.

D) A detailed sewage treatment plant site plan of a scale no greater than 1 inch = 50 feet containing all information necessary to judge the suitability of the site location proposed. Typically, the plan must clearly detail an area of at least 500 feet surrounding the proposed plant site and must show all property lines, property ownership, property zoning, existing and future structures, rights-of- way, easements, water supply wells, surface water bodies, wetlands areas, storm water recharge facilities and utilities. Site plans shall bear the original seal and signature of a licensed professional engineer or architect registered for practice in the State of New York. The proposed STP shall not be located underneath the surface of the ground, such as under a parking lot, etc.

3. Soil information on at least two soil borings or test holes:

   A) In the recharge area.

   B) At STP construction site.

   The boring or test hole location and log shall be placed on the site plan. Refer to Section 10 of the general standards "Subsoil and Groundwater Conditions" for detailed information on depth of boring or test hole.

4. A flow schematic of the proposed STP including piping and pumps, chemical additions, sludge system, recycle and return lines, etc.

5. A hydraulic profile through the STP from the influent sewer invert to the end of the effluent discharge pipe.

6. A statement of the effluent requirements to be met by the proposed treatment plant. In the case of discharge to groundwater, standards require that a Total Nitrogen (as N) concentration of 10 mg/l not be exceeded. Refer to NYSDEC Effluent Standards and/or Limitations for Discharges to Class GA Waters (6NYCRR 703.6).

7. Present and future population to be served and corresponding average daily and maximum hourly flows to the treatment plant.

8. Influent sewage characteristics, including BOD5, SS, TKN, etc.

9. A description of the treatment process:

   A) Indicate the design criteria used for sizing of the treatment units.

   B) Show detailed calculations for the actual units being proposed.

10. A detailed discussion of the total air requirements at the STP. Indicate the size and number of blowers to be provided. In the case of the activated sludge process, the report shall show that sufficient air will be available for BOD reduction and conversion of the influent nitrogen to nitrate. Additional air shall be provided for the surge tank, digester, airlift pumps, sand filter backwash air scour, etc.

11. Detailed calculations for sizing of chemical storage tanks and feed equipment. The chemicals usually provided are sodium hypochlorite, methanol and caustic soda. Storage of chemicals shall conform to Article 12 of the Suffolk County Sanitary Code.

12. A narrative and design covering the following required items:

    A) Potable water to the treatment plant and pump station, protected by an approved reduced pressure backflow prevention device.

    B) Emergency standby power to maintain flow throughout the plant and for operation of other critical equipment.

    C) An observation well in the vicinity of the leaching pools for monitoring groundwater.

    D) A totalizer, indicator, recorder to monitor plant flow.

    E) Laboratory facilities, including a lab bench with sink and test equipment to perform the required daily tests.

    F) A control building to house the laboratory facility and the chemical feeders.

    G) An enclosure for the blowers and electrical panel.

    H) Color coding for process piping.

13. Further information if necessary or required by the Department.

B2. **TREATMENT UNITS**

Typical biological nitrification - denitrification treatment processes used in Suffolk County are Extended Aeration Activated Sludge or Rotating Biological Contactors followed by Deep Bed Filters but other processes may be approved. The Deep Bed Filter accomplishes denitrification and solids removal and is equipped with an automatic backwash system. The influent to the filter is inoculated with a carbon source (methanol).

The total required clarifier and filter areas shall be divided among two or more units. Multiples of other treatment units may also be required.

Preliminary treatment devices shall be designed to remove or reduce in size large suspended or floating solids; to remove heavy inorganic solids; and to remove excess amounts of oils and grease.

Flow equalization shall be provided to dampen the diurnal flow variation, and thus achieve a constant or nearly constant flow rate through the downstream treatment processes. Separate equalization basins are required.

Facilities for disinfection of the sewage effluent shall be provided and designed in accordance with Ten State Standards.

Facilities for waste sludge handling and storage shall be provided and designed in accordance with Ten State Standards. For small size plants, an aerobic digester is usually provided. The report must also address final sludge disposal.

A control building shall be provided to house the laboratory facility and the chemical feeders. In addition, an enclosure shall also be provided for the blowers and electrical panel to protect the equipment from adverse weather and to reduce noise impact on the environment.

In the case of effluent recharge to groundwater, final disposal facilities may consist of subsurface leaching pools or a minimum of 4 recharge beds. The maximum allowable design rate for tertiary filtered effluent is 10 gpd per sf of pool sidewall area or bed bottom area (5 gpd per sf for unfiltered effluent). This rate is conditioned on acceptable soil conditions being encountered.

A minimum of 100 percent expansion area shall be provided for the sewage treatment plant and for future leaching facilities. This plant expansion area may be modified for small private plants if the property is fully developed.

B3. **LOCATION OF WASTE WATER TREATMENT FACILITIES**

The site location for wastewater treatment facilities shall be selected to insure that public health hazards are not caused by airborne spread of pathogens and contamination of water supply wells. Care shall also be exercised to insure that neighboring resources are not degraded and that usage of neighboring properties are not impaired.

To protect the public water supply and the benefits that freshwater wetlands, tidal wetlands, ponds, streams and other surface waters provide, all projects within 1500 feet of a public water supply well or projects containing wetlands or surface waters will undergo a separate site review. The following criteria apply to these sites:

A) Wastewater treatment facilities shall be located to maximize distances to public water supply wells. If the department determines that insufficient distance exists to protect the well, further measures may be required.

B) Wastewater treatment facilities shall be located so as to maximize distances to freshwater wetlands, tidal wetlands, ponds, streams, and other surface waters, provided that the criteria in 1. above are satisfied. In no case may any portion of the facilities be placed closer than 300 feet from the boundaries of regulated freshwater wetlands, regulated tidal wetlands, ponds, streams, or other surface waters.

C) Boundaries of wetlands and surface waters must be shown accurately on surveys and site plans as per requirements set forth in **Appendix D** of the standards.

Separation distances, as hereinafter listed, are considered to be the minimum allowable and are based upon a typical system being well operated and judiciously maintained. Every reasonable effort should be expended to provide separation distances in excess of those tabulated. The Department reserves the right to require all remedial actions necessary; including but not limited to, enclosing of odor causing facilities and the installation of adequate ventilation and odor destruction equipment should objectionable conditions arise during actual plant operation. Approval of water pollution control plant site location and design shall not be interpreted as relieving the owner from responsibility for remedial action should objectionable conditions arise in the future.

Below are separation distances which shall be maintained between water pollution control plant units and tenantable structures, and between water pollution control plant units and property lines of developed or buildable property. Where neighboring properties are currently vacant, separation distances shall be measured to the pertinent setback distance required by present zoning.

Where the tabulated separation distances are shown for enclosed facilities, those reduced distances are based upon inclusion within the enclosure of noise control, proper ventilation and positive odor removal devices. Ventilation systems shall be designed to maintain a negative pressure inside the enclosure with respect to the outside ambient environment of sufficient magnitude to prevent the inadvertent escape of noxious odors. Special emphasis should be placed on architectural detail to insure a “tight” enclosure.

Positive odor removal shall be taken to include ozonation, thermal incineration, oxidation by chemical oxidants, adsorption on sorptive media, or any like process which removes and/or destroys the odorous constituents of the ventilated gases. Use of masking agents shall not be permitted.

REQUIRED MINIMUM SEPARATION DISTANCES

	DISTANCE TO STRUCTURE OR BUILDING SETBACK	DISTANCE TO PROPERTY LINES
Sewage Treatment Processes Open To The Atmosphere	400'	350'
Sewage Treatment Processes Enclosed [1] In a Building	200' [2]	150'
Effluent Recharge Beds	400'	300'
Leaching Pools	25'	25'
Chemical Storage	All chemical storage, whether in dry bulk form and/or liquid stored in tanks shall meet the provisions of Article 12 of the Suffolk County Sanitary Code.	

[1] Enclosed building designation requires ventilation, odor and noise control devices in accordance with good engineering practice.

[2] Non-residential structures located on the same parcel may qualify for lesser distances.

B4. **PROCESS PIPING COLOR CODING**

It shall be a requirement for all sewage treatment plants that process piping be color coded and identified with stenciled markings. Identification markings shall be stenciled at suitable locations on the piping and lettering shall be of such size to allow easy identification.

Unless otherwise approved, lettering shall be 2 inches high and spaced at no greater than 10'-0" between identifying markings. Color coding and identification markings shall be as follows:

SERVICE	COLOR	MARKING
Sludge	Brown	SL
Gas	Yellow with Red Bands at 30 - inch intervals	G
Potable Water	Blue	C.W.
Sewage	Gray	S
Chlorine or Hypochlorite	Yellow	CL
Compressed Air	Green	A
Chemical	Orange	L - Lime F - Ferric M - Methanol Na - Caustic P - Polymer
Non-Potable Water (Recycled Effluent)	Orange with Red Band at 12 inch intervals	X
Fire Protection	Red	

B5. **LABORATORY REQUIREMENTS**

All wastewater treatment facilities shall provide the means necessary for proper process control and operation. Area for laboratory facilities shall be provided in a building on the plant site. The building may also house process equipment, lavatory facilities, storage rooms, etc; however, the laboratory shall be isolated from other equipment housed in the enclosure by means of partition walls and doors. The laboratory shall be heated and ventilated to provide an indoor temperature of at least 70 degrees F when the outside temperature is 0 degrees F. At least two duplex GFI 120V electric outlets shall be located in close proximity to laboratory benches. Outlets shall be located to allow operation of all electrical laboratory equipment on laboratory benches and tables. Lighting shall be provided to produce a light

intensity of at least 50 foot-candles over the entire laboratory area and at least 100 foot-candles over laboratory benches.

Laboratories shall be equipped with ample bench and storage space to allow safe storage of equipment and reagents. The following storage and work space shall be supplied:

1. 1 - 60"L x 30"D x 36"H bench with at least 3 storage drawers and cupboard. The bench top shall be of corrosion resistant material;
2. 1 - 60"L x 12"H x 12"D shelf.
3. 1 adjustable lab stool.
4. 1 - 18"W x 29"D X 12"H steel file cabinet.
5. 1 lab sink manufactured of corrosion resistant material, equipped with 2 goose neck faucets suitable for heavy duty laboratory service, and serviced with hot and cold running water.
6. Suitable drainboards and drying racks.

Facilities and an ample supply of test equipment shall be provided to perform the following tests at the STP for day to day operational control:

	TEST	EQUIPMENT REQUIRED
1.	Settleable solids	Imhoff cones
2.	Dissolved oxygen	Portable D.O. meter
3.	Ammonia nitrogen	Color comparitor
4.	Nitrite nitrogen	Color comparitor
5.	Nitrate nitrogen	Color comparitor
6.	TKN	Color comparitor
7.	pH	pH meter
8.	SVI	1000 ml graduated cylinders, centrifuge
9.	Total residual chlorine	Color comparitor
10.	Free residual chlorine	Color comparitor
11.	Temperature	Laboratory thermometer

Other tests on STP effluent parameters as listed in the discharge permit (SPDES permit) are to be performed by an approved outside laboratory and submitted monthly to authorities listed in the permit.

B6. **GROUNDWATER MONITORING WELL**

A minimum of one monitoring well as hereinafter specified, and as shown on the drawings, shall be provided and maintained on all wastewater treatment projects requiring department approval. The specifications are contained in “Procedures and Standards for the Design and Installation of Monitoring Wells at Sewage Treatment Plants”.

B7. **RECHARGE BED DESIGN**

Recharge beds shall be designed on the basis of 10 gallons per day per square foot of bottom area for filtered effluent or 5 gallons per day per square foot of bottom area for unfiltered effluent. An area shall be set aside for future 100% expansion of the beds.

Beds shall be a maximum of four (4) feet in depth including freeboard, shall be equipped with access ramps for ease of cleaning and shall be equipped with splash pads at the ends of influent piping.

Beds shall be separated into four independent areas valved to allow alternate dosing.

For further information regarding recharge bed design consult the Department.

B8. **TESTING REQUIREMENTS**

Prior to approval of any sewage treatment plant or pump station, all tanks, piping and appurtenances shall pass the following tests.

All testing shall be scheduled and conducted by the contractor prior to the operation of the plant. The Department of Health Services shall be given at least 48 hours notice prior to the start of any phase of the testing procedure. All testing shall be witnessed and reported by the engineer certifying construction.

Prior to testing, during the entire testing procedure, and prior to putting the plant into operation, all tanks, piping and appurtenances shall be cleaned and flushed of all debris, grease, oil, water and other deleterious materials. At no time shall the discharge from the flushing operation be allowed to pass through any equipment.

1. EXFILTRATION AND STABILITY TEST

All tanks shall be subject to an exfiltration and stability test.

Prior to testing any tank or tank complex, the tank(s) shall be backfilled to finished grade and all piping and/or equipment within the tank which might affect the watertightness of the tank shall be completely installed and operable. A minimum of 8 elevations shall be obtained around the periphery of the outer walls of each tank or tank complex.

Each individual tank shall be isolated from other tanks by plugs, etc., and filled with clean water to the maximum operating level. After a suitable stabilization period, the maximum operating level shall be reestablished and an 8 hour leakage test shall be performed. During the test, no water shall be added to or taken from the tank. The change in water level shall be recorded at the end of the 8 hour period. Allowable loss is 1/4 inch in 8 hours. Any leaks shall be repaired by methods and materials approved by the engineer and the Department prior to the start of the corrective action, and all leakage shall be corrected prior to the performance of equipment testing. During the testing of each individual tank, all adjacent tanks shall be empty of all water.

After each individual tank has passed the 8 hour leakage test, all tanks within each complex shall be filled with water to the normal operating level. Elevations shall be obtained around the periphery at the same locations as prior to the leak test. Before and after elevations shall be reported to the department.

2. WET WELLS

Wet wells shall be filled to the maximum operating level or one foot above the crown of the influent pipe whichever is higher and tested as outlined above.

3. INFILTRATION TESTS - TANKS AND WET WELLS

In addition to the exfiltration tests outlined above, all tanks and wet wells which are constructed with the lowest elevation of the structure below normal groundwater shall be subject to an infiltration test. Each tank complex or wet well shall be completely backfilled, emptied of all water, and an infiltration test shall be conducted. It is intended that the test will be made after the groundwater has stabilized to normal elevation. A 48 hour continuous test period is required with the maximum allowable infiltration being 1/4 inch. Normal groundwater level shall mean the elevation to which groundwater stabilizes when unaffected by any dewatering operations within the area of influence.

4. PIPING

In addition to flushing all pipe lines, the following requirements apply:

A) Air system - prior to connection of diffusers and air lifts to the main piping, the system shall be run at maximum obtainable air flow to insure that all dust, dirt, scale, debris, etc., are scoured from the system. Piping shall be tested according to manufacturer's specifications.

B) Other - Prior to operation, a piping system shall be tested and leaks repaired according to manufacturer's specification.

5. EQUIPMENT

All wiring and installation of appurtenances shall be completed prior to the testing of a piece of equipment. All machinery and equipment shall be put in service and tested under the supervision and direction of a representative of its manufacturer who has complete knowledge and responsibility for the equipment and is capable of making any adjustments and/or replacements required. All miscellaneous systems (alarm, remote telemetry, etc.) shall be tested from all access points. All required testing equipment shall be furnished by the contractor.

All blowers, pumps, generators, etc. shall be tested in place to insure that they do indeed conform to the requirements of the contract specifications. All motors shall be tested to insure that they do not exceed their name plate rating over the range of normal operation.

Engine generator sets shall be tested at full load conditions by simulating a utility power failure. All equipment which might normally be at load under power failure shall be in operation during this test.

After testing is completed to the satisfaction of the engineer and the Department, the manufacturers shall certify to:

A) The proper installation of the equipment.
B) The satisfactory compliance with testing requirements in accordance with design and approved specifications.
C) The validation of equipment guarantees.

One copy of the above noted certification(s) on the manufacturer's letterhead shall be supplied to the Department by the certifying engineer.

B9. **ENGINEERING CERTIFICATION**

Construction of sewage treatment and disposal systems shall be certified by a licensed professional engineer. The licensed professional engineer is to certify that the installation and testing has been carried out in accordance with approved plans and Suffolk County standards.

The Department prefers that the duties of construction inspection be carried out by the engineer responsible for designing the project. However, any independent licensed professional engineer is acceptable to the department provided that the design engineer and owner authorize the choice. In order to assure impartiality, the inspecting engineer must have no financial or other vested interest in the construction contractor or installer. In cases where the design engineer acts as the installer, the inspecting engineer shall be independent.

Samples of certificates and log sheets to be used in the certification procedure can be found in **Appendix C**. All certifications and test documentation papers are to be submitted to the Department at time of application for final approval except for Authorization of Engineer which shall be submitted prior to commencing construction.